Improving GOES-R Temperature/Moisture Retrievals and Derived Products and NearCasts using Hyper-spectral POES Soundings and Validating NearCast Products for GOES-R Proving Ground

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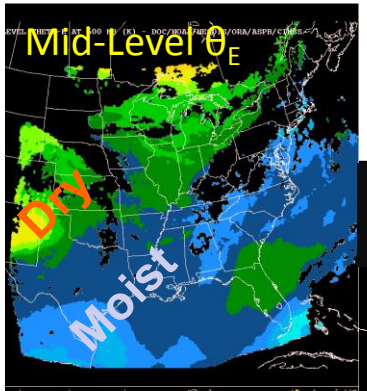
The overall objectives of this efforts are expand upon previous NearCasting effort by:

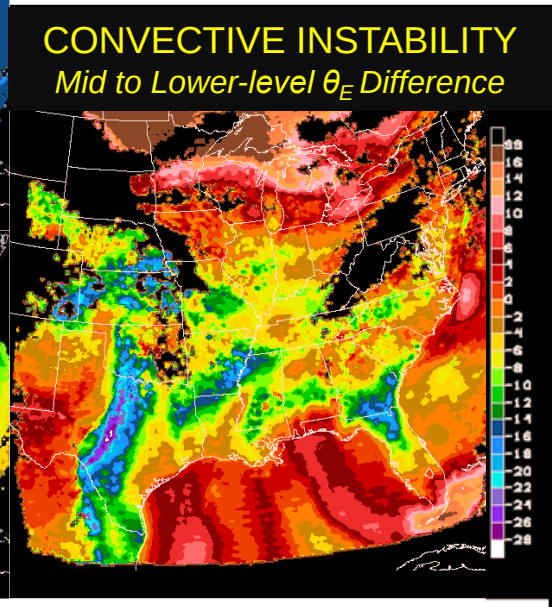
1) Determining how information contained in hyper-spectral POES retrievals can be used to enhance GOES-R products

   - *'Extend' the high-resolution POES data from their native 6-hourly observing frequency to the much shorter time and higher spatial resolution GOES intervals*
   - *Build upon past experiences by using these products in NearCasts covering the 6-8 hours interval until the next POES products are available*

2) Performing a comprehensive assessment and validation of the NearCasting products across all of the participating GOES-R Proving Ground sites.



Example of NearCast of Destabilization near DWF



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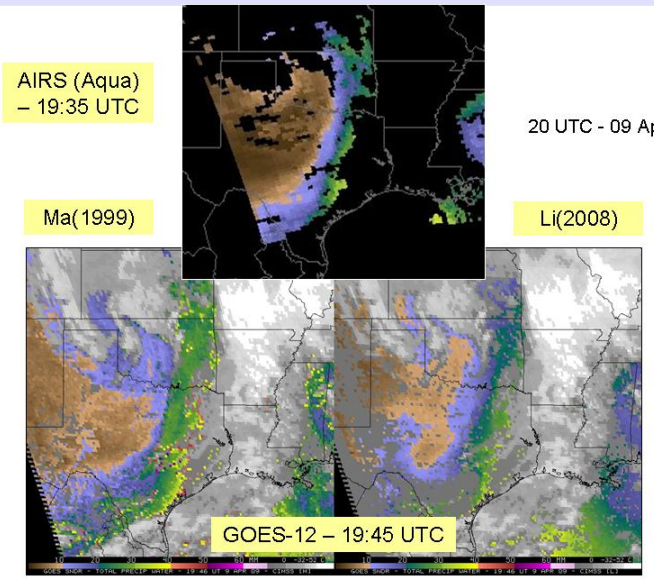
Specific Tasks:

1 – Use POES hyper-spectral retrievals to continuously recalibrate/adjust real-time GOES-R products (*from GOES AWGs*) by determining/applying spatially and temporally varying bias corrections.

- *Effectively, NearCasting methods will allow the lower resolution but temporally continuous GOES-R ABI data to time/space-interpolate between and beyond successive higher vertical resolution, but 6-hourly, POES observations.*
- *Initial tests will be use simulated data (CIMSS WRF)*

Comparison of AIRS TPW with 2 GOES algorithms shows superiority of POES 'snapshot' - but lacks time/space continuity -

Example comparing TPW from AIRS and the GOES Sounder



2 - The NearCasting model may also be reconfigured into isentropic coordinates to extend further the value of the enhanced data sets

- *An alternative of assigning parcels to levels based on the peaks of the weighting function of the GOES data at each observation is also being considered*

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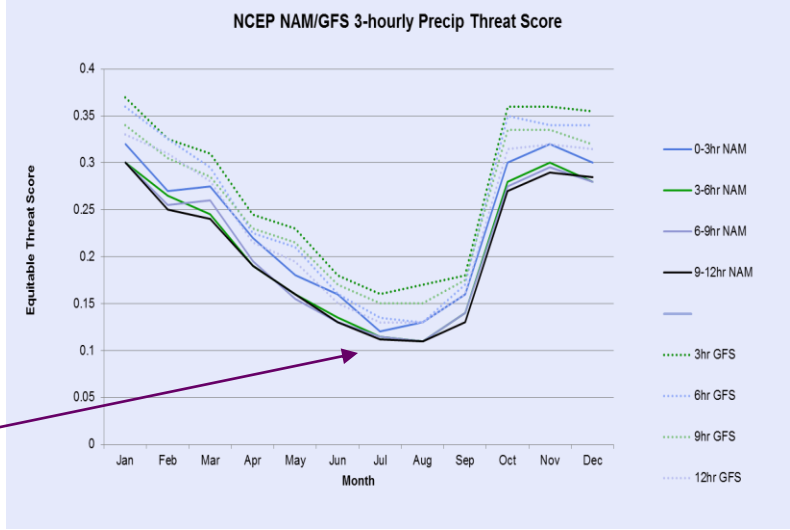
3 – Expand GOES-R Test Bed Evaluations beyond NCEP's Storm Prediction Center (SPC) and Aviation Weather Center (AWC) to include the Hydrological Prediction Center (HPC) and Ocean Prediction Center (OPC).



- *Validations at each Centers will use different, mission-oriented parameters, e.g., SPC will focus on Severe Convective and Instability, AWC will include all kinds of convection development and termination, while HPC may focus on the structure and timing of small-scale moisture plumes, especially in summer when NWP skill is lowest*

- *Develop objective validations measures to quantify the performance and utility of the NearCasts using a variety of a variety of co-located a-synoptic data sets, including, among others:*
  - *Surface-based GPS TPW,*
  - *Automated aircraft temperature/moisture data, and*
  - *NWP forecasts (to assess added value from GOES data and NearCasts)*